Multicontroller II
AutoCam™ Controller

Operation, Installation
And Maintenance
(pn AB-300100 for sn 82xxxx0010 - 082699)

Vinten

Multicontroller II

Safety

IMPORTANT!: Read the Safety Section starting on page 1-2 before installing or using this equipment, or attempting any adjustment or repair. This safety triangle is used in the manual to indicate important information. Read this information carefully to avoid the risk of personal injury, injury to others, or damage to the equipment.

Warning Labels

Various colored safety labels are attached to the AutoCam equipment to alert you to hazardous situations. The labels and their meaning are described below.

DANGER (with a red background) indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING (with an orange background) indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION (with a yellow background) indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION (with a yellow background, but without the Safety Alert symbol) indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Critical Data For Multicontroller II

Mass (Weight)	11.0 lb (5.0 kg)
Maximum Load	Not applicable
Maximum Pressure	Not applicable
Input Voltage	100-250 VAC 47-63 Hz
Input Current	0.9 A at 110 V 0.45 A at 220 V
Date Of Manufacture	1999

Technical Support

If you are based in North, South or Central America and need technical support on the AutoCam system, contact Vinten Inc. at:
709 Executive Blvd.
Valley Cottage, NY 10989
USA

Phone:1-888 4 VINTEN (1-888-484-6836) - Toll free in the U.S.A.
+1 845-268-0100
Fax:+1 845-268-0113

Or, if you are based outside of North, South or Central America, contact Vinten Broadcast Limited at:
Western Way
Bury St. Edmunds
Suffolk IP33 3TB
ENGLAND

Phone: +44 (0) 284 752121
Fax: +44 (0) 284 750560

Warranty

Vinten, Incorporated (Vinten) warrants that its equipment shall be free of defects in material and workmanship for a period of twelve (12) months from the first date of installation, but no more than eighteen (18) months from date of shipment, and is extended only to the original purchaser. Vinten, at its option, will repair or replace defective components. Warranty covers only those defects that occur when the equipment is used in the manner described in the Operation, Installation, and Service manual. Vinten's liability is limited to parts, material, and labor necessary to repair or replace equipment manufactured by Vinten. Any and all consequential damages are excluded. Consumable supplies and normal wear items are the customer's responsibility and are not covered by this warranty.

The warranty is in effect only when equipment is operated, adjusted, and maintained in the manner described in the appropriate Operation, Installation, and Service manual. Modifications, service by non-authorized service personnel, failure to provide proper maintenance, and abuse and misuse of the equipment will void the warranty. Repairs not covered by this warranty will be billed for parts, labor, and expenses at the rates in effect at the time of service.

Warranty service and repair will normally be performed at the Vinten factory in Valley Cottage, New York, but may, at the discretion of Vinten, be performed on the customer site. It is the customer's responsibility to contact Vinten and obtain authorization prior to returning equipment for warranty service. Returned equipment must include a Return Material Authorization (RMA) number, and a failure report describing the nature of the failure or complaint as well as the customer's name, address, and a contact name and phone number.

Copyright

The Vinten Inc. AutoCam User Manual is copyrighted with all rights reserved. Under the copyright law, this manual may not be copied, in whole or in part, without written consent from Vinten Inc.

© 1998, 1999 by Vinten Inc.

Disclosure Statement - AutoCam System

This document contains information proprietary to Vinten Inc. Except by written authorization from Vinten Inc., the information contained in this document shall not, in whole or in part, be disclosed to third parties, reproduced for any purpose, or used except for evaluation, operation and maintenance of equipment supplied by Vinten Inc. or Vinten Broadcast.

Manual Outline

This manual covers the installation, operation and maintenance of the AutoCam Multicontroller II. See Chapter 1 for a detailed description of the contents of this manual.

Product Serial Numbers

Vinten AutoCam products are marked with unique serial numbers that include a 2 digit product identifier, a 4 digit serial number and a 2 character revision code. The format is AABBBBXXCD where:

AA	Product Identifier - 82 for the MultiController II
BBBB	Serial number
XX	Reserved for future use - currently 00
C	Primary revision status - 0, 1, 2, 3 etc.
D	Secondary revision status - 0, A, B, C etc.

This manual is applicable to products that have serial numbers 82xxxx0010 where xxxx may be any 4 digit number.

AutoCam™, Vinten Inc.™ and Lubricated Friction (LF™) are trademarks of Vinten Inc. or Vinten Broadcast Limited.

Specifications and features are subject to change without prior notice.

(082699)

Multicontroller II ii
Safety ii
Warning Labels ii
Critical Data For Multicontroller II iii
Technical Support iv
Warranty v
Copyright vi
Disclosure Statement - AutoCam System vi
Manual Outline vi
Product Serial Numbers vi

1 Safety & Introduction

Safety Issues 1–2
Very Important Information 1–2
Customer Responsibility 1–2
Safe Working Environment 1–2
Safe Operating Zone 1–2
Warning Signs 1–3
Heads Can Start Unexpectedly 1–3
Power Switches 1–4
Pinch Points 1–4
Sharp Edges 1–4
Manual Outline 1–6
Introduction 1–8
Features 1–9
Typical System Configuration 1–10
Power Supplies 1–11
Data Cables 1–11
Pan and Tilt Heads 1–12
Tally 1–12
Switcher Control 1–12

2 Operation

Introduction 2–2
The Control Panel 2–3
Mains Power 2–3
PTZ Joystick 2–3
Lens Focus 2–4
Time 2–4
Display Windows 2–5

Shot Functions 2–5
On Shot LED 2–5
Numeric Keypad 2–6
Range Limits 2–6
Alt Button 2–6
Manual Operation 2–7
Framing Shots 2–7
Joystick Sense 2–7
Pan And Tilt Limits 2–7
Creating, Saving & Recalling Shots 2–8
Introduction 2–8
Creating Shots 2–8
Recalling Shots And Making Transitions 2–9
Time 2–9
Move and Jump Transitions 2–9
Stopping A Move Or Jump 2–10
Trimming And Resaving A Shot 2–10
Multiple Moves 2–10
Exploring Moves 2–10
Air-Time Philosophy 2–11
Tracking 2–11
Trimming 2–11
Cueing 2–11
Command Functions 2–12
Turning Functions On and Off 2–12
Function Status 2–12

3 Installation

Introduction 3–2
Mechanical Installation 3–4
MultiController II 3–4
Tabletop Dimensions 3–4
Recessed Mounting 3–5
Grounding For CE Compliance 3–6
Power Supplies 3–6
Router 3–6
Monitors 3–7
Electrical Installation And Interconnection 3–8
Data Cables 3–9
PS-4 Supply 3–9
PS-1 Supply 3–10
Router 3–10

Monitors 3–10
Tally 3–11
Command Functions 3–12
Powering And Configuring The System 3–14
Powering Up 3–14
Power Up Sequence 3–14
Head Type Cofiguration 3–16
Proportional/Fixed Speed 3–16
HS-102 3–16
HS-105 3–16
HS-2010 3–16
Configuring The Controller 3–17
Controller Range Limits 3–18
Pan Limits 3–18
Tilt Limits 3–19
Joystick Setup 3–20
Joystick Centering 3–20
Joystick Speed 3–20
Joystick Deadband 3–20

4 Maintenance And Repair

Routine Maintenance 4–2
Electronics Repair 4–3
Service Philosophy 4–3
Safety 4–3

This page left blank intentionally.

1 Safety & Introduction

Safety Issues

Safety issues including important warnings, risks and related topics are covered in this section of the manual. It is very important that this information be available to all personnel who will work on or near the Autocam equipment.

Very Important Information

1. To avoid personal injury, always exercise caution when working in the vicinity of energized heads as they can start to move without any warning.
2. Unless it is impossible, you should always de-energize the head before working on any part of the head, the camera/lens, or any associated equipment.

Customer Responsibility

It is the customer's responsibility to ensure that the workplace is safe. Make sure that you comply with local safety requirements for owning and operating robotic equipment. In normal operation, the remote controlled heads and payloads in an Autocam system can move suddenly and without warning. Since audible warnings are out of the question in normal television applications, it is recommended that only trained personnel be allowed to work in the active areas where the remote controlled heads and payloads are located. As part of the training, personnel must be made aware of the hazards of working in a robot environment, including the specific hazards listed below. The forces are sufficient to cause personal injury, or injury to others and therefore, caution is essential.

Safe Working Environment

Each of the remote control heads should be within the view of the operator of the Autocam system at the Multicontroller II. Before and during remote operation, the operator must verify visually that the active area is clear. If personnel are too close to one of the heads that is about to move, the operator can prevent the motion from starting, or stop the motion after it has started.

If the direct line of sight is obstructed in your installation, it is recommended that one or more viewing cameras are installed to cover the active areas and allow the operator to view the entire workspace at all times.

Safe Operating Zone

The safe operating zone for personnel is a minimum of 3 feet (1m) outside of the footprint of the pan/tilt head. In most installations, the teleprompter (if installed) is the piece of equipment mounted on the head that protrudes the furthest beyond the base of the head. The footprint must take into account the overhang of the teleprompter and/or other payload equipment as the head pans around.

If your operating practices require personnel to work less than 3 feet (1m) outside the footprint of the pan/tilt head, you must make sure that they are trained and are aware of the hazards of working in a robot environment, including the

specific hazards listed below. The forces are sufficient to cause personal injury, or injury to others and therefore, caution is essential.

Warning Signs

Warning signs should be displayed prominently in the workplace as a reminder to trained personnel, and a primary warning to untrained personnel and visitors. A typical sign might read:

WARNING:
Robotic Heads & Cameras
Move Suddenly Without Warning

Heads Can Start Unexpectedly

The hazards associated with robotic camera systems are only slightly different than those associated with operating a camera under conventional manual control. The speeds and camera weights are similar. The main difference is that with automation, the operator is normally not near the cameras, and it is more difficult to verify that the area is clear. For personnel working on or near the equipment, they must be aware that the equipment can start moving unexpectedly.

All personnel should be trained and aware of the hazards of robotic heads, and the fact that they can move at any time. They must be trained on how far the heads and payloads can move, the speeds involved, and the need to stay back an appropriate distance.

Most adjustments to the camera and head, such as tilt balancing and camera video, should be made with the system de-energized. However, if adjustments are absolutely necessary while the head is powered, they should only be made by trained technical personnel familiar with the AutoCam robotics system. They must understand that the camera can move unexpectedly at any time, and must position themselves so that any motion would not cause them personal harm.

When the robotic heads move, the speeds involved are fairly slow. However, the equipment is still capable of generating sufficient force to cause injury. Therefore, it essential that you exercise caution. In particular, be aware that the teleprompter is usually the fastest swinging element.

Any failure of the system could possibly cause one or more axes to move on their own, but the speeds and forces should not be noticeably greater than those encountered during normal use.

Power Switches

For an emergency power down, make sure that all personnel are aware of the location of the power switch on the power supplies (and heads if they have separate power switches).

Pinch Points

Particular care should be exercised around possible points where you could get pinched, such as the tilt cradle. Here, the forces can be somewhat greater, due to the short lever arm.

Sharp Edges

If the lens, teleprompter or other camera attachments have sharp edges that could cause injury, make sure they are padded or protected.

This page left blank intentionally.

Manual Outline

Chapter 1	This chapter covers important safety issues and gives an overview of the Multicontroller II and the AutoCam system.
Chapter 2	Step by step instructions for operating the Multicontroller II.
Chapter 3	Step by step instructions for installing and configuring the Multicontroller II and associated equipment.
Chapter 4	Technical information including routine maintenance, circuit descriptions, calibration, schematics and parts lists.

This page left blank intentionally.

Introduction

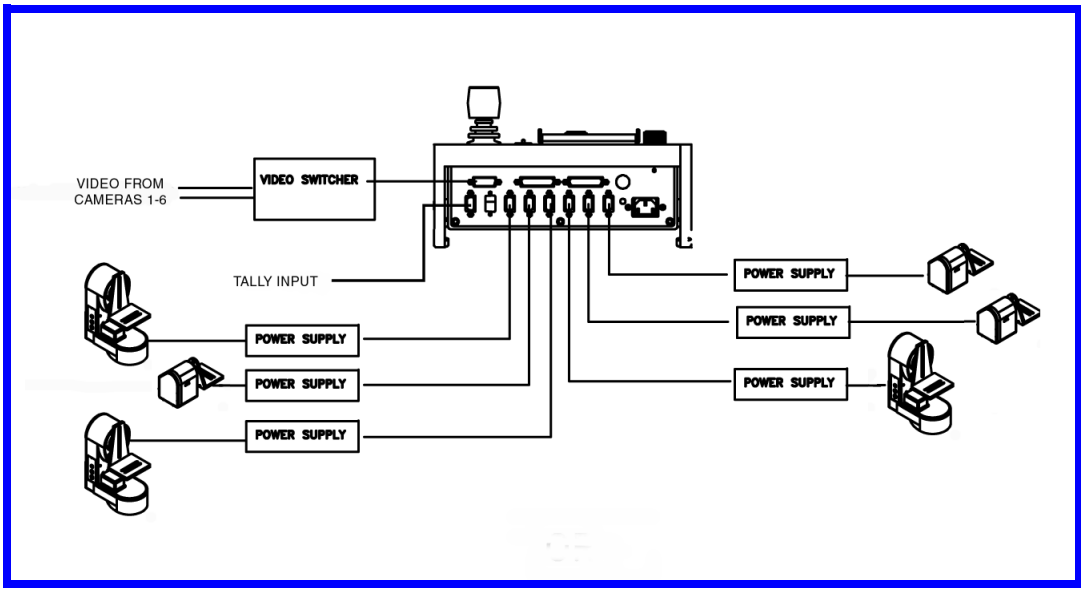
The Vinten Multicontroller II is a mid scale six head controller that combines many of the latest features and performance enhancements from the top of the line AutoCam systems while retaining the popular Multicontroller control panel format. The Multicontroller II is ideally suited for most medium scale legislative and broadcast applications such as city halls, compact studios and remote trucks.

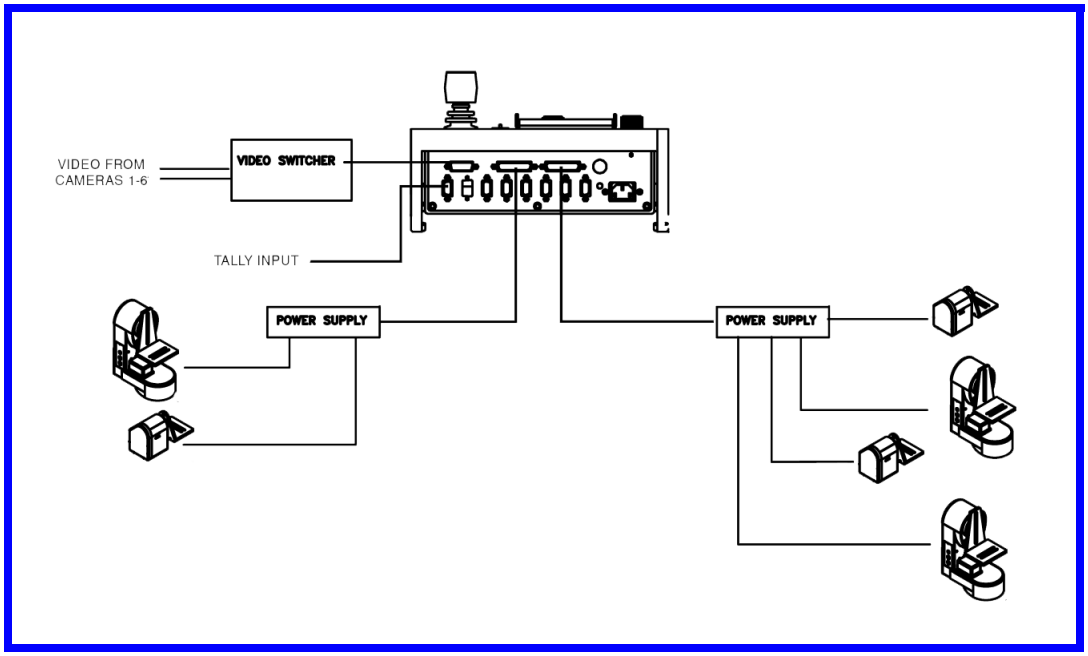
Features

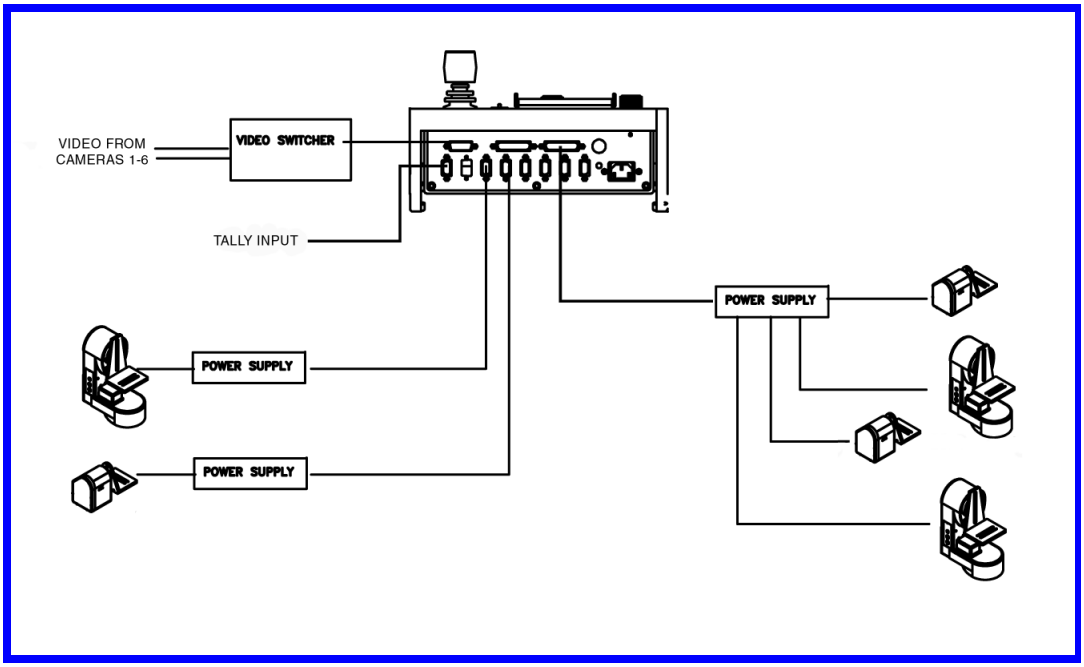
- Controls up to six AutoCam heads of mixed type and payload from the HS-102P up to the HS-2010MH
- Stores 99 shots per head
- Control panel operation is easy to learn - head status is visible at a glance
- Six kinematic co-processors allow unlimited simultaneous moves
- Software profiles all axes in Jumps as well as Moves
- On air confidence is enhanced by “on air” and “on stick” LED indicators and automatic jump lockout
- Local clip settings and LED indicators prevent pan/tilt joystick overrun
- Move times calibrated to 0.1 second accuracy
- Joystick speed can be constant or can track zoom angle
- Controls video router for automatic monitor switching (optional)
- Status indicators show condition of remotely controlled lighting, heaters, wipers etc.
- Compact design available for flush mounting in a desk or in a table top case
- Preprinted shot cards
- CE compliant design

Typical System Configuration

The diagrams below illustrates the interconnection of a typical Multicontroller II System.







Power Supplies

Depending on the installation requirements, up to four heads may be connected to a single power supply (e.g. heads 1 through 4 above), or a separate power supply per head may be used (e.g. heads 5 and 6 above). The selection of the power supply will depend on the types of heads installed and the distances between them. Power and data is routed from the power supply output connectors to each head via individual cables.

Data Cables

Two options are available for connecting control data (RS-422) from the Multicontroller II to the power supplies.

Separate data cables can be connected from the individual control output connectors (one per head) on the Multicontroller II to each power supply (see cameras 5 and 6 above). This method is best suited to installations where individual power supplies are used.

Installations that have 2, 3 or 4 heads connected to a single power supply will typically use the Control A and/or Control B control output connectors. Control A provides control data for heads 1 through 4 on a single cable to the power supply (see heads 1-4 opposite) and Control B provides control data for heads 3 through 6. Note that data for heads 3 and 4 is present on both Control A and Control B - the heads can be controlled via one connector or the other, but not both.

Pan and Tilt Heads

From 1 to 6 AutoCam pan/tilt heads can be controlled by the Multicontroller II. The head types can be any mix of HS-102P, HS-105P, HS-2010MH or HS-2010R.

Tally

The tally input to the Multicontroller II is used to control the on air tally LEDs on the control panel.

Switcher Control

The Multicontroller II provides RS-232C control of a video router for automatic routing of the selected (on stick) camera to the video monitor.

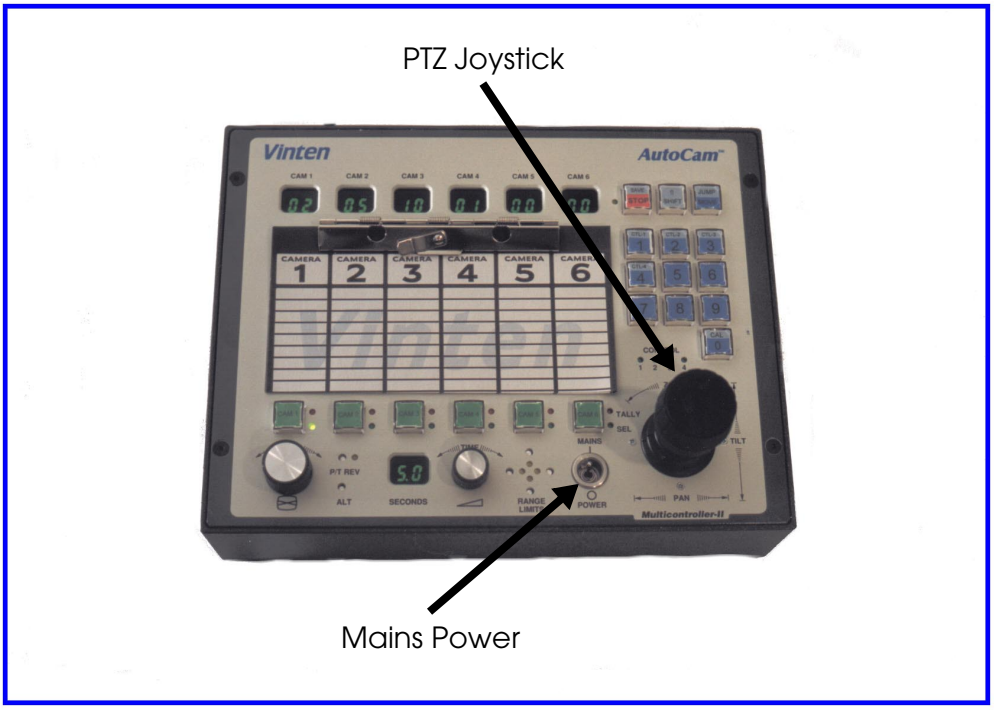
2 Operation

Introduction

This chapter covers the use of the MultiController II for manual control of the pan/tilt head and lens, creating, saving and recalling shots and other operational features.

The Control Panel

The control panel of the MultiController II is shown below.



Mains Power

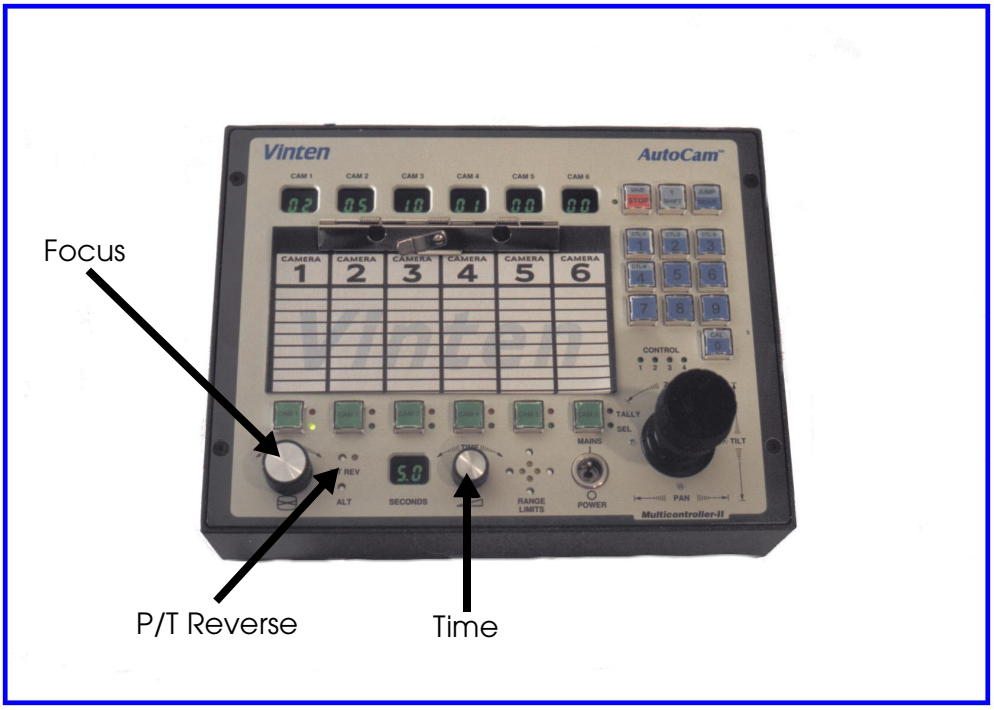
The AC power switch for the MultiController II - Up is On and Down is Off. Note that turning the MultiController II power off does not remove power from the heads. Use the power switches at the power supply and head (if appropriate) to power down the heads.

PTZ Joystick

The joystick on the lower right of the control panel is used to control the pan, tilt and zoom of the selected camera. Push the stick left and right to pan the camera. Push the stick up and down to tilt the camera. Turn the joystick knob clockwise/ counter-clockwise to zoom the lens tighter or wider. The sense of direction of the pan and tilt axes are set with the Reverse Joystick switch described below.

The pan, tilt and zoom controls are of the “rate” type. If the stick is moved to the left or right and then held there, the camera will continue to pan at a constant rate until it reaches the end stop. The pan and tilt rates are contoured so that small joystick movement results in almost imperceptible motion, while full deflection of the joystick results in rapid camera movement.

The responsiveness of the joystick and the size of the deadband are set during installation - see Chapter 3.



P/T REV (Reverse Joystick)

The Reverse Joystick switch (recessed button - lower left) sets the direction sense of the joystick. This switch sets the direction sense for all cameras simultaneously. Normally, the stick behaves like a pan handle attached to the rear of the camera. When you push the stick up, the camera lens tilts down. When you push the stick down, the lens tilts up. Similarly, if you push the stick left, the lens pans to the right, if you push right, the lens pans to the left.

In reverse joystick mode, the sense is reversed as though you are pointing the lens with the joystick. Push down and the lens tilts down, push left and the lens pans left, and so on.

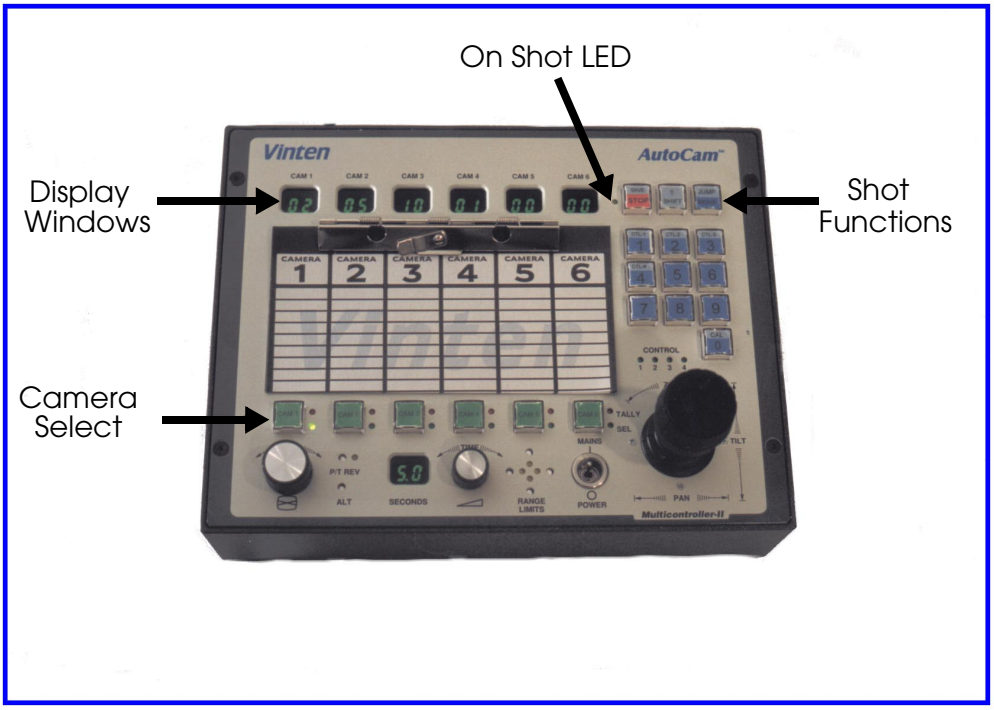
There is no right or wrong way to operate the joystick - choose the mode that you are most comfortable with.

Lens Focus

Lens focus is on the left control knob. It operates in the same way as a conventional pan bar mounted focus control.

Time

The duration for Move transitions (described later) from one shot to the next is set with the Time knob (lower center) and is indicated on the adjacent display. The duration can be set from 0.5 up to 99 seconds - turn the knob clockwise to decrease the time.



Camera Select

The row of six buttons (CAM 1 through CAM 6) selects the camera to be controlled. The green LED beside the button for the selected camera will be lit. If the switcher tally output has been connected to the MultiController II, the red LED will light to denote the on air camera.

Display Windows

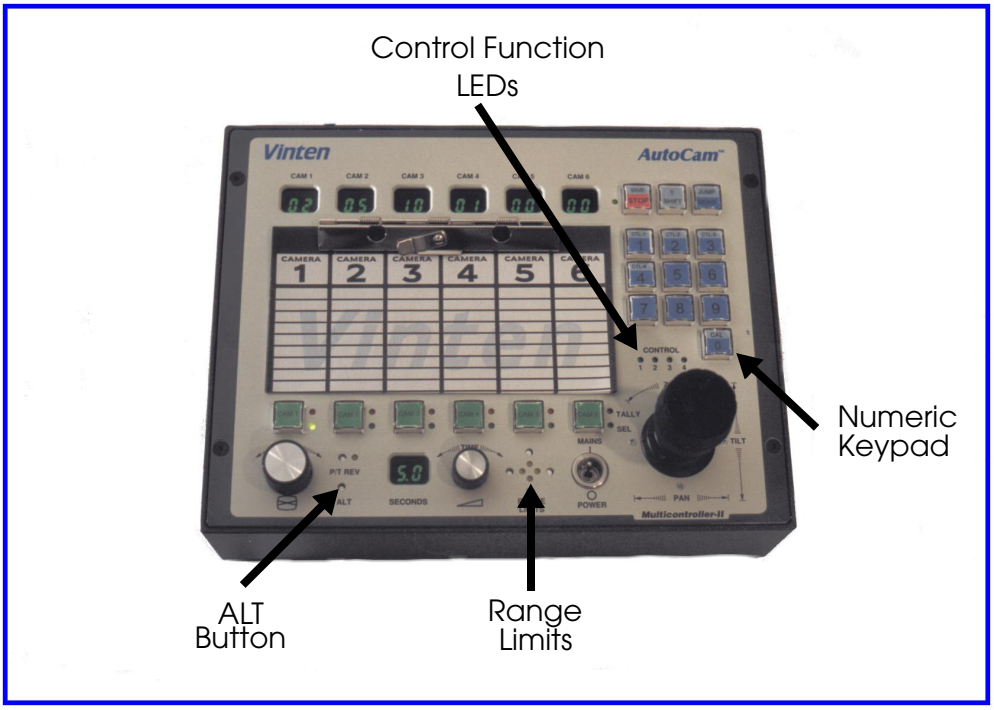
For each camera, a two character display indicates the shot number for saving and recalling shots. The display is also used for configuration during installation - see Chapter 3.

Shot Functions

The group of buttons in the upper right of the control panel are used for storing and recalling shots as described later in this chapter. The LED adjacent to the SAVE/STOP button will be on if the currently selected head is moving to a new shot during a Move or Jump transition. When the new shot is reached, the LED turns off. In addition, if the head is at a recalled shot (LED off) and you trim the pan, tilt, zoom or focus, the LED turns on to indicate that the head is no longer positioned at that shot.

On Shot LED

This LED will be On if the currently selected camera is not positioned at the recalled shot that is displayed for that camera. In other words, the LED will be On if the selected camera is in a Jump or Move to a new shot, or if the camera has been trimmed away from the recalled shot using the joystick.



Numeric Keypad

Used to enter shot numbers, and configuration settings. In conjunction with the Shift function, buttons 1 through 4 toggle the state of the four Control functions. In conjunction with the Shift function, button 0 selects the Calibration mode.

Control Function LEDs

Four on/off control signal lines can be used to toggle external devices that are connected at the head. These LEDs indicate the on/off status for the four Control functions.

Range Limits

The pan and tilt ranges for each head can be restricted at the controller to prevent the heads from hitting obstacles or for other reasons. The LEDs turn on to indicate that a controller limit has been reached and that the head cannot move any further in that direction. The recessed switches are used to activate the limit setting mode as described in Chapter 3.

Alt Button

The recessed Alt button is used in conjuction with other keys during system configuration and calibration - see Chapters 3 and 4.

Manual Operation

The first step in AutoCam operation is to practice using the MultiController II to manually frame up to six cameras.

Framing Shots

1. Before you make a move, check to see that the camera is free to swing without hitting anything.
2. Select one of the cameras and use the controls to frame a shot that you will use in a production. Since the controls do not carry the mass of the camera, they will feel very responsive - a light touch is usually all that is needed. Gentle movements are recommended. Most conventional camera techniques are still applicable, even though the camera is operated remotely.
3. Practice making small corrections in framing and focus as though you are tracking talent while your camera is on air.
4. Experiment with selecting and moving different heads/cameras through the complete range of operation for pan, tilt, zoom, focus. Although the system is intended primarily for automatic operation, it is important that all the operators be comfortable with “manual” operation in case it becomes necessary to operate in a “hands-on” mode.

Joystick Sense

In the Normal mode (LED Off), the joystick behaves like a pan handle attached to the rear of the camera. When you push the stick up, the camera lens tilts down. When you push the stick down, the lens tilts up. Similarly, if you push the stick left, the lens pans to the right, if you push right, the lens pans to the left.

In Reverse mode, the joystick behaves as though you are pointing the lens. Push down and the lens tilts down, push left and the lens pans left, and so on.

There is no right or wrong way to operate the joystick - choose the mode that you are most comfortable with.

To toggle the sense of the joystick, use the tip of a pencil or other non-metallic instrument to press the recessed P/T REV button.

Pan And Tilt Limits

The controller range limits for pan and tilt are set during the installation - see Chapter 3.

During normal operation, the LEDs to the right of the Time knob will turn on if you reach the pan or tilt limit or both. Pushing the joystick in the same direction will have no effect. Simply push the joystick in the opposite direction to move the head away from the electrical limit.

Creating, Saving & Recalling Shots

Introduction

In this section, you will learn how to create, save and recall shots. A total of 100 shots can be saved for each of the six cameras. The shot numbers for save and recall are numbered from 00 to 99. The shots are saved in non-volatile memory and retained if the power is turned off.

Creating Shots

In the following example, you will create and save a wide shot in a first memory location, and then you will create and save a tight shot in a second memory location.

The following steps assume that no shots are currently stored in the first two memory locations. If you have shots saved in these locations that need to be preserved, use other locations to save your new shots.

1. Press the CAM button for the camera that you want to use. The green LED beside the button will turn on to confirm that you have control.
2. Temporarily zoom in tight (twist the joystick knob) on a spot that will be roughly in the center of the wide shot you are about to create. Push the joystick left/right/up/down to locate something to focus on. Use the focus knob to focus the lens.
3. Using the joystick, zoom out and frame a suitable wide shot.
4. Use the numeric keypad to enter 00 - the memory location that the shot will saved in. (You can use any location from 00 to 99, always using two digits, i.e. 00, 01, 02 etc.)
5. Press and hold the SHIFT button while you press and release the SAVE button.
6. You can use the shot card to make a note to remind you which shot this is. During an actual show or production you can refer to the shot card as the director calls for specific shots.
7. Use the joystick (and focus knob if necessary) to frame a suitable tight shot with the same camera.
8. Enter 01 (or some other memory location) using the numeric keypad, press and hold the SHIFT button while you press and release the SAVE button. Note the shot description on the shot card.

Your wide and tight shots are now stored, and can be recalled as described in the next section.

Recalling Shots And Making Transitions

With two shots saved so far (a wide shot in location #00 and a tight shot in location #01), you can now make a transition from one shot to the other. The transition can be a Jump or a Move.

A Jump repositions the head at maximum speed to the new shot and is typically only used for rapid off-air setup. Make sure that nobody is close to the head before using a Jump transition. For safety, try to plan ahead and give yourself enough time to use Move transitions whenever possible.

In a Move transition, the head will accelerate smoothly, travel towards the new position and then decelerate smoothly and come to rest at the new shot. The duration of a Move is determined by the setting of the Time control. All four axes (pan, tilt, zoom, focus) change in a coordinated manner and arrive at the end point simultaneously.

Time

For Move transitions, the speed at which the head transitions from the current position to a recalled shot is determined by the Time knob. Time can be set from 0.5 to 99 seconds From 0.5 to 10 seconds the time increment is 0.1 seconds and from 10 to 99 seconds the increment is 1 second. At the high end of the range, the head will move very slowly, barely creeping along. At the low end of the range, once the head is moving at its maximum speed, reducing the Time setting further will have no effect.

The Time setting for each camera is independent. When you select a given camera, the Time setting for that camera is recalled and shown in the display. Therefore, you must always select a camera before adjusting the Time.

Normally, you will adjust the Time knob before selecting a shot and starting the Move or Jump transition. However, even if the transition is already under way, the duraton can still be varied to a certain extent by turning the Time knob to speed it up or slow it down.

Move and Jump Transitions

To recall a shot and transition to it:

1. Select the camera that will be used for the shot (CAM 1 in our example). The LED beside the button will turn on to confirm that you have control.
2. Set the Time to around 4 seconds.
3. Use the numeric keypad to enter 00 (or other 2 digit number) - the memory location that the wide shot is saved in. (You can use any location from 00 to 99, always using two digits, i.e. 00, 01, 02 etc.)
4. Press JUMP/MOVE to initiate the transition. The LED next to the SAVE/STOP button will be on during the move and will go out when the camera reaches the new position. If you need to get to the next shot as quickly as possible press and hold the SHIFT button while to press JUMP/MOVE.
5. Repeat steps 3 and 4 to recall the tight shot stored in memory location 01.

Stopping A Move Or Jump

If a camera is being sent to the wrong shot, or if you need to abort a Move or Jump for safety reasons:

1. Press the SAVE/STOP button to immediately stop all heads from moving.

NOTE: All heads that are in motion will immediately stop when you press the SAVE/STOP button. You cannot stop individual heads.

Trimming And Resaving A Shot

Sometimes you may want to trim a stored shot. For example, if a different anchor is filling in for a few days, it may be easier to trim and resave the shot rather than have to adjust it during each show. When the normal anchor returns you can trim it to the original setting and resave it again.

1. Select the desired camera, select the shot and Move or Jump to it.
2. Trim the pan, tilt, zoom and focus as needed.
3. Press and hold SHIFT while pressing SAVE/STOP to update the shot with the trimmed values.

Multiple Moves

As soon as you initiate a Move or Jump on one camera, you can select a different camera, select a shot and initiate another Move or Jump. The MultiController II can simultaneously profile moves on all six cameras.

Exploring Moves

To gain familiarity with the system and its operation, it is a good idea to simulate a real on air production using two or more cameras.

1. Create and save the shots you need for camera #1. This may include wide and tight shots, over the shoulder shots and so on. Use the shot card to make a note of the location of each shot.
2. Explore various Moves between the shots for Camera #1.
3. Try different Time settings to find the best value for Camera #1.
4. Repeat steps 1, 2 and 3 for the other cameras.
5. Practice switching between cameras and initiating multiple simultaneous Moves.

Air-Time Philosophy

While airing a show, you will find yourself occupied with three very important yet distinct activities: tracking, trimming, and cueing. They will generally have different priority levels.

Tracking

Tracking the on air talent or speaker to keep them in the frame is usually the top priority. Therefore, most of the time, you will have the on air camera selected so that you can use the joystick to follow the talent if they shift in the frame. The system's smooth response system makes subtle on air moves very easy.

Trimming

Trimming is thinking ahead to the next shot, and verifying it before it is taken to air. Shortly before a camera is put on air, you will want to select it, make sure that the correct shot has been recalled and trim the shot's framing and focus if necessary.

Select the next camera to go on air, verify that the shot number in the display is the one you want, and make sure that the shot is cued - the LED next to the SAVE/STOP button is off. Check the video and trim the framing and focus if necessary. Typically, in just a second or two, you can select the next camera, trim it, and go back to the live camera to monitor the tail end of the present shot. Trimming is priority number two.

Cueing

Cueing is the process of setting up as many shots as possible ahead of time to stay ahead of the director. You will cue a shot so that it is ready for trimming just before it is taken to air. If you have multiple cameras in your system, the on air camera is in "tracking mode", the camera for the next shot is in "trimming mode", and the remaining camera(s) can be cued by recalling the next shot required. Cueing is usually the lowest priority and can be deferred if things get busy.

Command Functions

Four command functions for each head can be controlled from the MultiController II. These command functions can be used to control external devices via the accessories port on selected heads. The functions can be used for customized control of heaters, lighting, windshield wipers etc. Refer to the User Manual for your head for information on port availability and wiring.

Turning Functions On and Off

1. Select the desired camera.
2. Press and hold the SHIFT button while you press and release 1, 2, 3 or 4 on the numeric keypad for the function you want to turn on or off.

Function Status

The on/off status of the command channels is displayed by the four LEDs above the joystick.

3 Installation

Introduction

The installation process for the MultiController II includes mounting the controller, cabling the system and configuring it for operation. Installation instructions for the pan and tilt heads can be found in the User Manuals for the heads.

For proper performance of the equipment and to prevent personal injury it is essential that the installation procedures are followed.

This page left blank intentionally.

Mechanical Installation

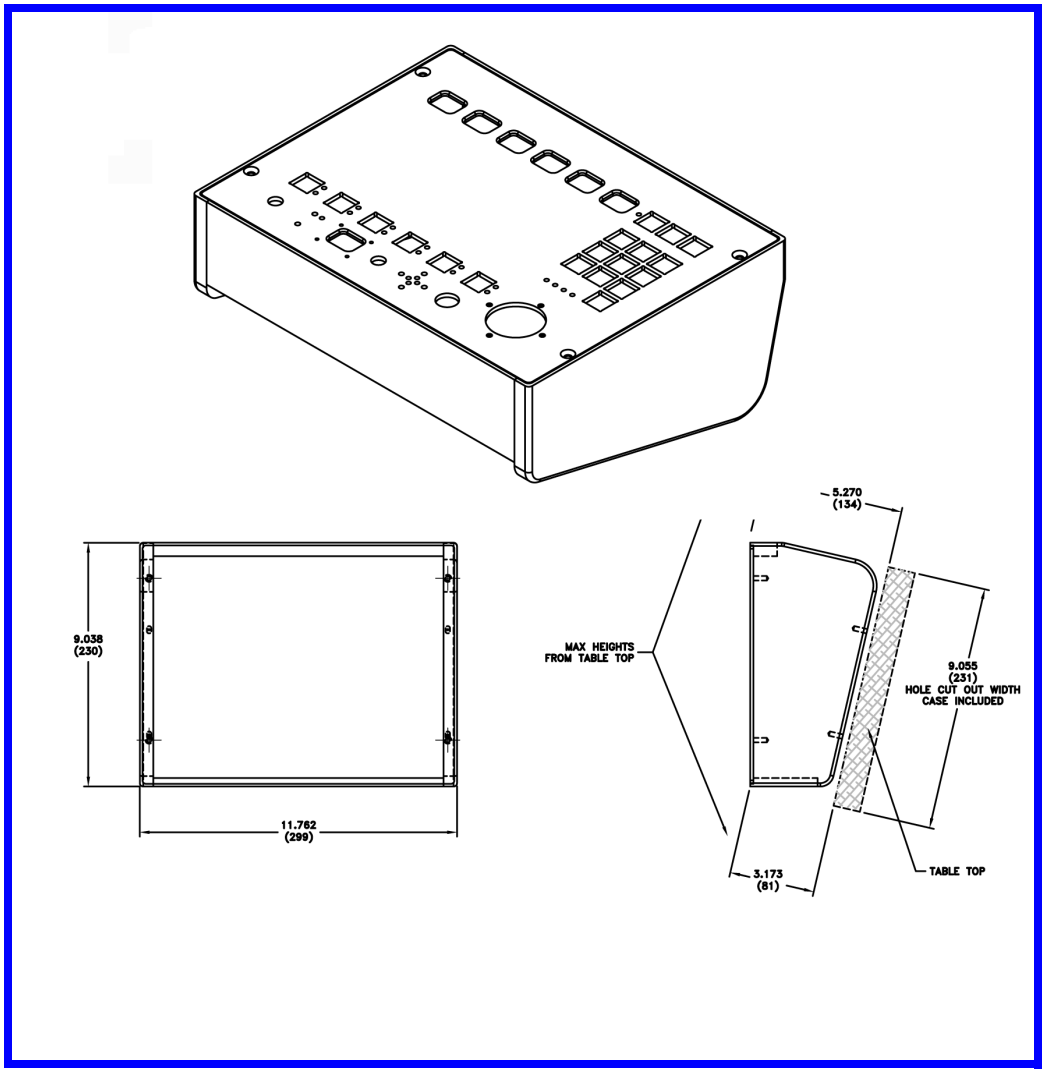
Before connecting AC power to any of the equipment, check the labels on each piece of equipment to make sure that it is the correct voltage for your installation (i.e. 110 or 220 volts or dual voltage).

MultiController II

The MultiController II is supplied in either a tabletop case, or in a case that can be recessed into a desk or console.

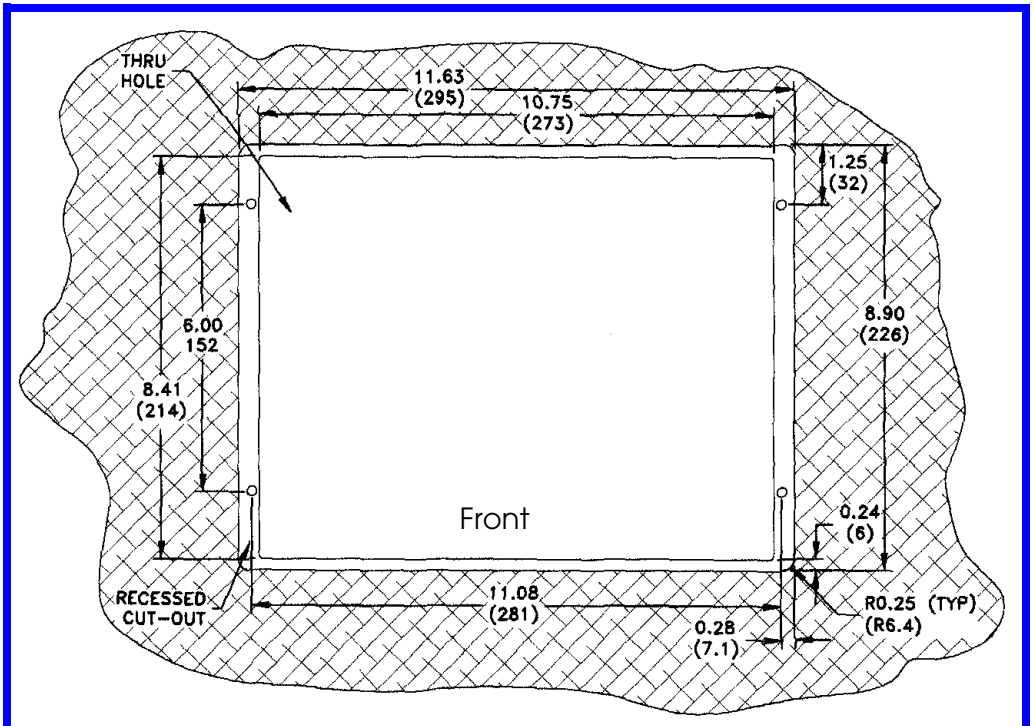
Tabletop Dimensions

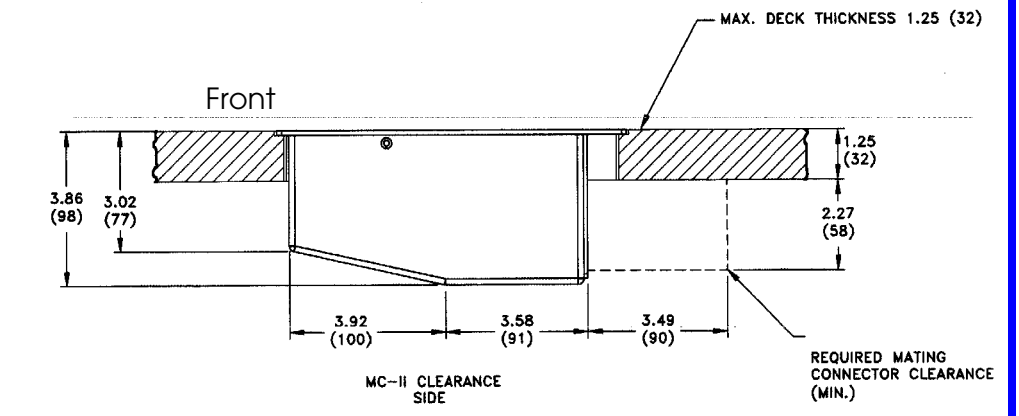
The following diagrams show the dimensions of the tabletop case.



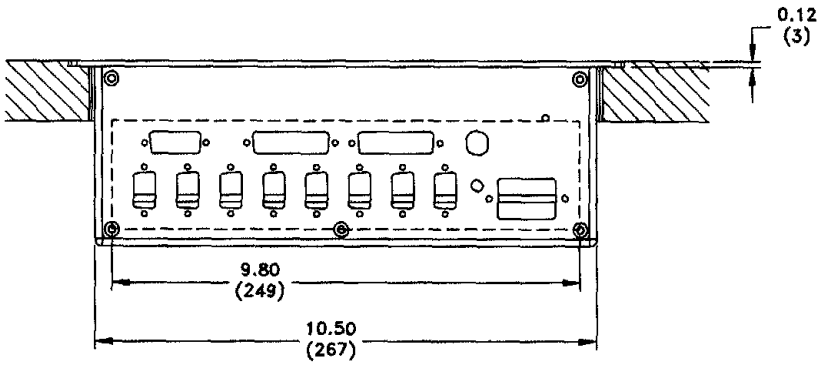
Recessed Mounting

If you are using the recessed mounting case, use the template dimensions below to cut out your desk or console.





Desk Cutout Dimensions



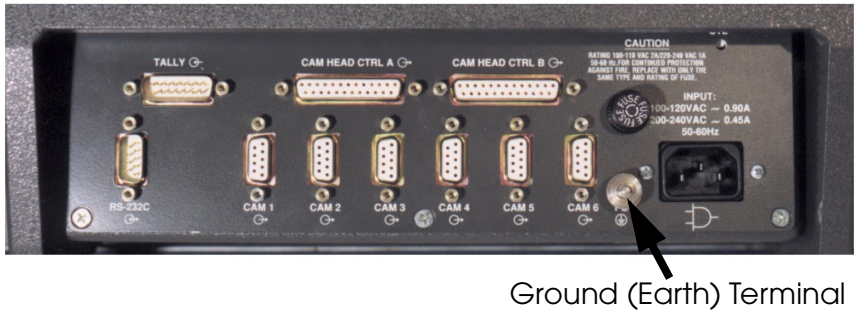
Rear Panel Clearance

Connect the AC power cord.

Grounding For CE Compliance

To meet the CE requirements for RFI, the MultiController II chassis must be grounded (earthed) to a true AC ground (earth) point. Connect a ground (earth) wire to the terminal on the rear of the controller and tighten securely.

MultiController II Rear Panel



Ground (Earth) Terminal

Power Supplies

Install the rack mount power supply (or supplies) up to 500 ft. (150 m) from the pan/tilt heads. Connect the AC power cord(s).

Router

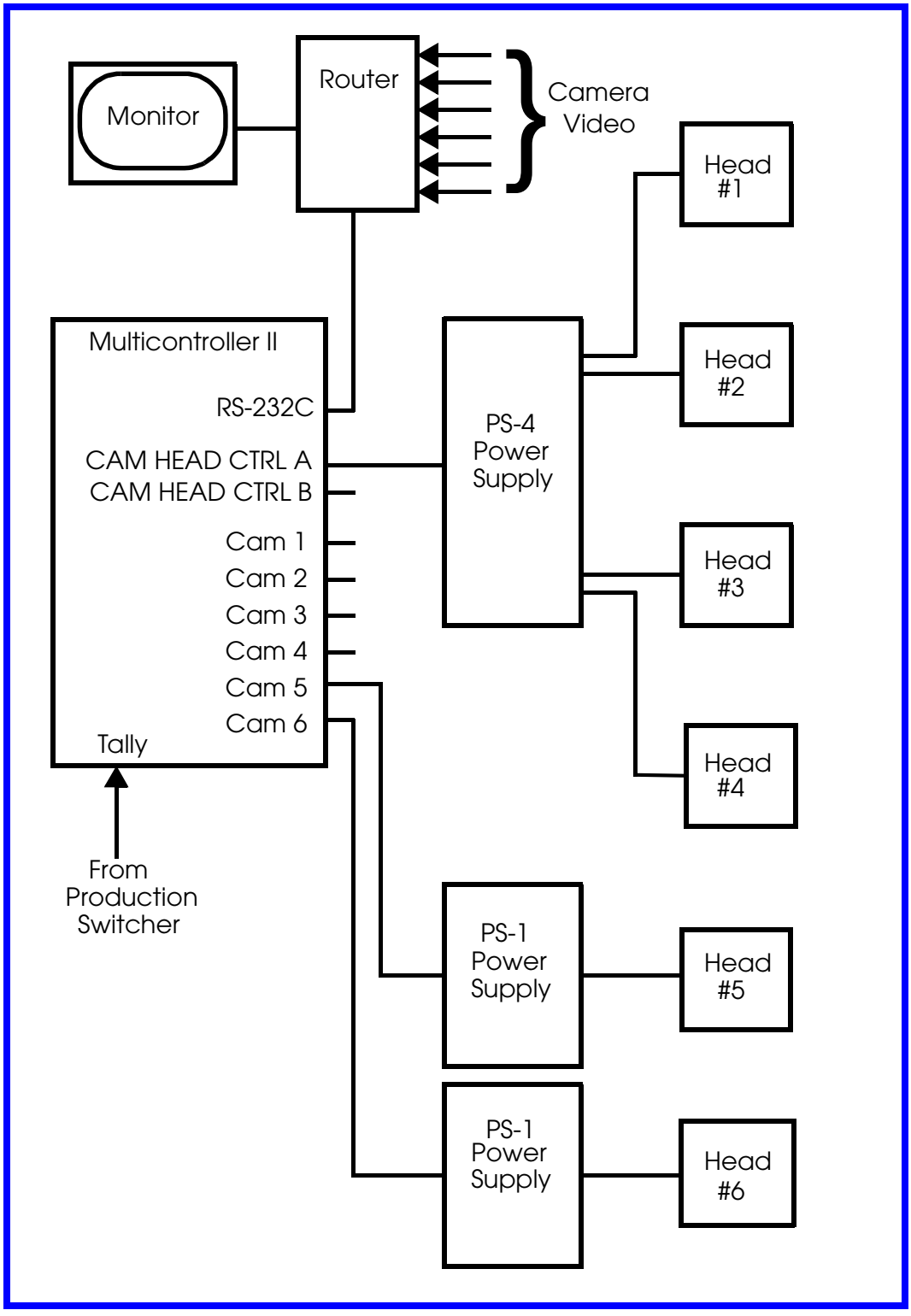
If you are using a video router controlled by the MultiController II to monitor the video output of the camera under joystick control, install it at a convenient location. Connect the AC power cord.

Monitors

You can use a single monitor on the output of the video router, or individual monitors on each camera or both. Install the monitor(s) for comfortable viewing by the MultiController II operator. Connect the AC power cord(s).

Electrical Installation And Interconnection

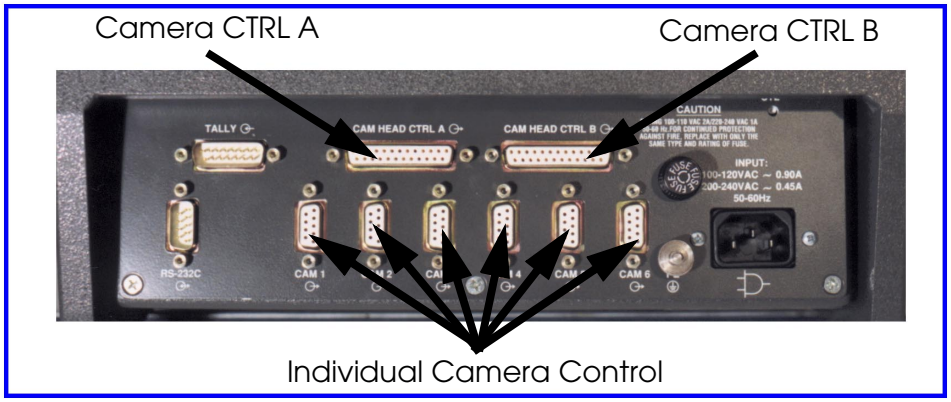
A typical system configuration for a MultiController II installation is shown below.



Your installation may have from one to six heads installed. The power and data cables are generally supplied by Vinten as part of the intial order. Additional or replacement cables can also be ordered from Vinten.

Data Cables

Two power supply configurations can be used with the MultiController II. PS-4 power supplies can be used to power and control up to four heads per supply. Or, a PS-1 power supply can be used for each head. Or, you can use a combination of both types of power supply. The diagram opposite shows both types of power supply being used. The data cables you need to install will depend on your power supply types..



The Control A connector on the MultiController II carries the data for cameras 1 through 4. The Control B connector carries the data for cameras 3 through 6. Note that data for cameras 3 and 4 appears on both control connectors. Therefore, if you are using two PS-4 power supplies, cameras 3 and 4 will be the #3 and #4 outputs on power supply A AND the #1 and #2 outputs on power supply B. Make sure that you only connect a head to the head #3 and head #4 ports on one power supply or the other - not both.

PS-4 Supply

Do not use the the CAM HEAD CTRL A or CAM HEAD CTRL B connectors to control a camera that is already connected to an individual control connector (CAM 1 through CAM 6).

1. Connect a data cable (25 pin D connectors) from the CAM HEAD CTRL A connector on the MultiController II to the data input connector on the first PS-4 power supply.
2. Connect power/data cables from the outputs on the power supply (7 pin Lemo connector) to the respective pan/tilt heads (from 1 to 4 heads).
3. If you are using a second PS-4 for the remaining cameras, connect a data cable (25 pin D connectors) from the CAM HEAD CTRL B connector on the MultiController II to the data input connector on the second PS-4 power supply.

4. Connect power/data cables from the outputs on the power supply (7 pin Lemo connector) to the respective pan/tilt heads (from 1 to 4 heads).

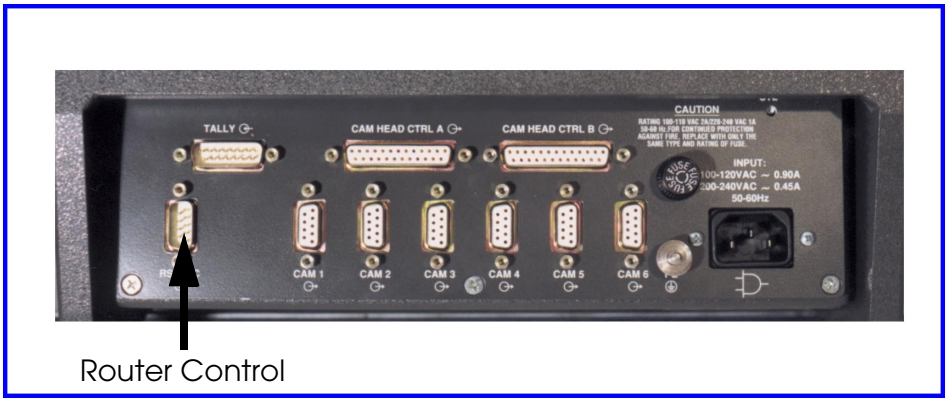
PS-1 Supply

Do not use the individual control connectors (CAM 1 through CAM 6) if that camera is being controlled via the CAM HEAD CTRL A or CAM HEAD CTRL B connectors.

1. Connect a data cable (9 pin D connectors) from the CAM 1 connector on the MultiController II to the data input connector on the first PS-1 power supply.
2. Connect a power/data cable from the power supply output to the pan/tilt head.
3. Repeat steps 1 and 2 for the remaining cameras.

Router

1. Connect the video output of each camera to its respective input on the video router.
2. Connect the router control cable (9 pin D connectors) from the RS-232C connector on the MultiController II to the control input connector on the router.



3. Connect the output of the video router to the operator's video monitor.

Monitors

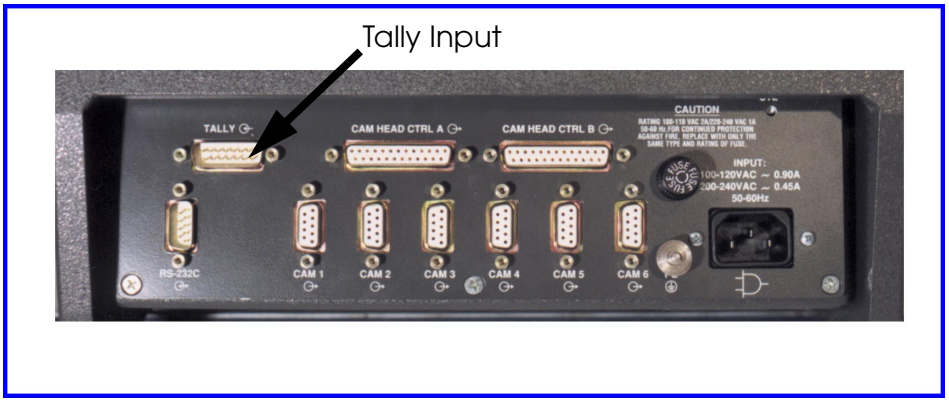
1. If you are using separate monitors for each camera, connect the video output of each camera to its respective monitor.

Tally

1. The Tally input requires a DC voltage of between 10 V and 30 V to activate the Tally LEDs. The pin out for the chassis mounted male 15 pin D connector is:

Tally Connector Pin #	Signal
1	Camera #1 (-)
2	Camera #2 (-)
3	Camera #3 (-)
4	Camera #4 (-)
5	Camera #5 (-)
6	Camera #6 (-)
7	no connection
8	no connection
9	Camera #1 (+)
10	Camera #2 (+)
11	Camera #3 (+)
12	Camera #4 (+)
13	Camera #5 (+)
14	Camera #6 (+)
15	no connection

2. Connect the tally indicator signals from your switcher to the 15 pin D connector on the MultiController II.



Command Functions

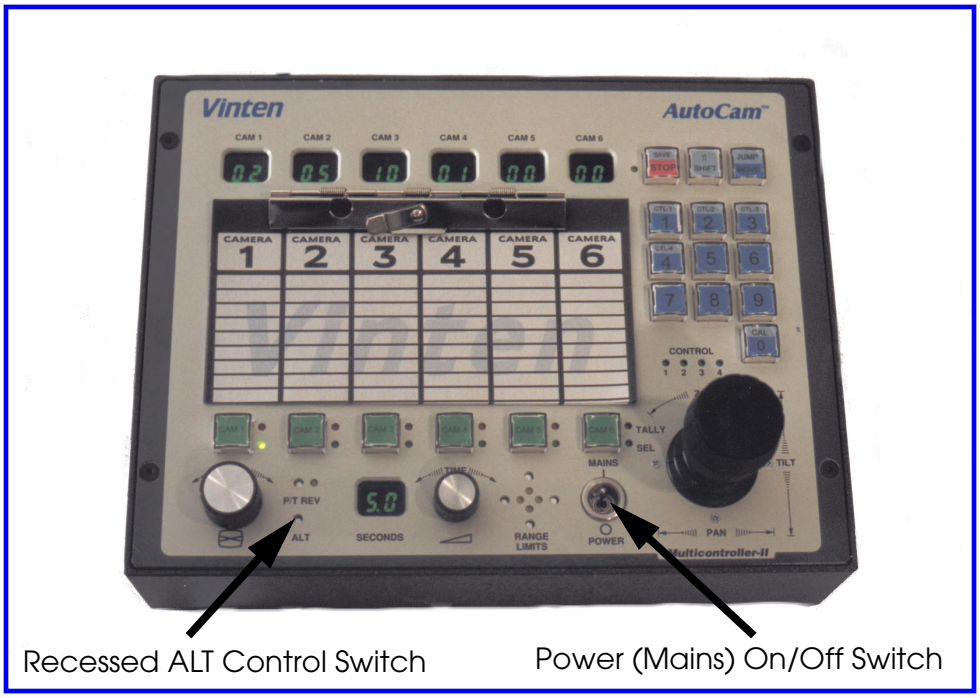
If you are using one or more of the Command functions to control external equipment at the head, refer to the User Manual for the head for information on pin assignments.

You are now ready to power up and configure the system.

This page left blank intentionally.

Powering And Configuring The System

All configuration codes, range limits and other settings are stored in non volatile memory and are therefore retained when power is off.



Powering Up

The Power On/Off switch is recessed to prevent accidental operation. Push the switch Up to turn the controller On. Push the switch Down to turn the controller Off.

Power Up Sequence

Electrically, it does not matter whether you power up the controller first or the heads. However, if possible, it is usually better to power up the controller first and then the heads. This will ensure that the heads always receive “clean” data. If the heads are powered up first, be aware that they may move suddenly as the controller powers up and initializes.

This page left blank intentionally.

Head Type Cofiguration

The following table lists the configuration choices available:

Config Code	Head Types	Baud Rate	Pan/Tilt Speed
00	HS-105, HS-102	2,400	Proportional
01	HS-2010	9,600	Proportional
02	HS-105 (custom)	9,600	Proportional
03	HS-102	19,200	Proportional
16	HS-105, HS-102	2,400	Fixed
17	HS-2010	9,600	Fixed
18	HS-105 (custom)	9,600	Fixed
19	HS-102	19,200	Fixed

Proportional/Fixed Speed

In Proportional mode, the pan and tilt speed in response to joystick motion is dependent on the current zoom angle. Therefore, when you are zoomed in tight, pan and tilt move more slowly thatn when you are zoomed out wide. Choose the mode that you feel most comfortable with and set all heads the same.

HS-102

Two baud rate choices (2,400 and 19,200) are provided for the HS-102. Make sure that you select the baud rate that matches the setting in the head itself. Refer to the HS-102 User Manual for information on setting the baud rate in the head.

HS-105

Two baud rate choices (2,400 and 9,600) are provided for the HS-105. The normal selection for the HS-105 is 2,400 baud unless you have a custom version of the head. Contact your Vinten representative if you are uncertain.

HS-2010

Use the HS-2010 selection if you are using either the HS-2010MH head or the HS-2010R head.

Configuring The Controller

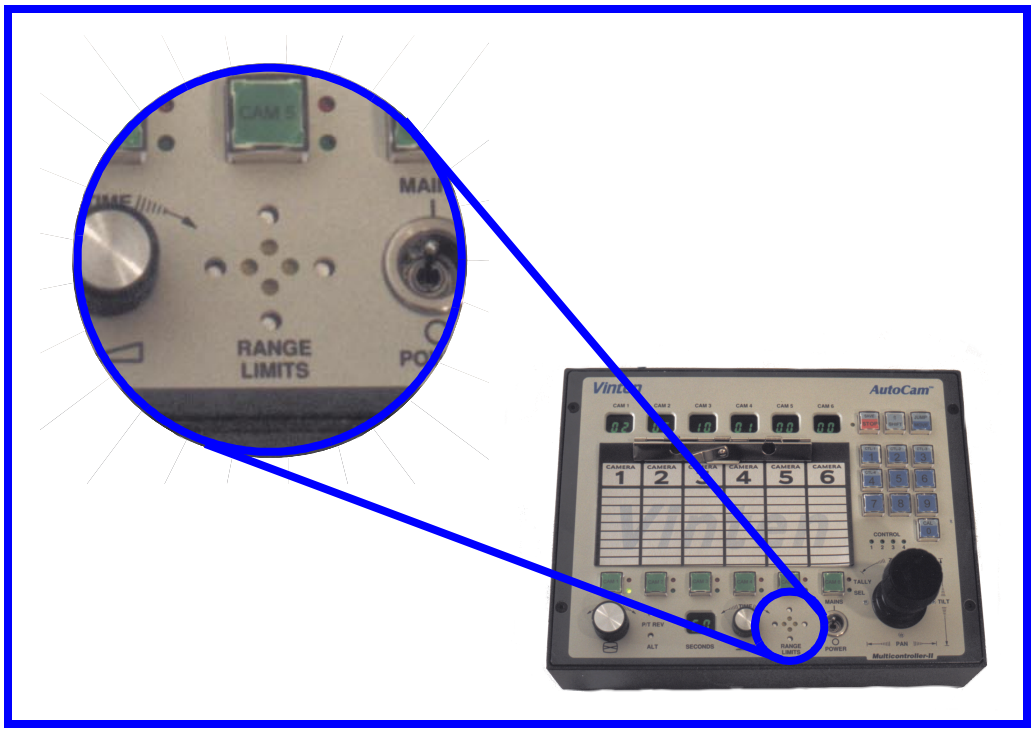
When you perform the configuration, the controller reads all of the display values and configures each head simultaneously. You must configure all of the heads at the same time. You cannot configure heads individually.

1. Select CAM1.
2. Use the numeric keypad to enter the two digit Config. Code for the head that is installed on CAM 1.
3. Repeat these steps for the remaining heads that are installed in your system.
4. Verify that the two digit configuration code displayed for each camera is correct.
5. Use the tip of a pencil (or a similar non-metallic instrument) to press and hold the recessed ALT button while pressing 1 on the numeric keypad.

Controller Range Limits

The primary purpose of the head clip parameters is to prevent physical damage to the head, lens and camera, and adjacent structures. The camera operator at the controller does not always have a view of the camera as it moves, and therefore cannot determine when and where collisions may occur. The controller range limits operate in addition to the limits that are set and stored in each individual head. Whichever limit is reached first will stop the head.

It is important to set the controller limits as well as the head limits. If you exchange heads and the replacement head has unknown limits, the controller limits will still be in effect.



Pan Limits

1. Select the head (CAM 1 through CAM 6) that you want to set the limits on. Before panning the head, make sure that nobody will be hit by any part of the head or payload. Make sure that you can see the head as it moves, or have an assistant watch the head and tell you when to stop to prevent a collision.
2. Use the tip of a pencil (or a similar non-metallic instrument) to press and release the left hand recessed Range Limit button. The left hand Range Limit LED will be flashing to indicate that the limit is wide open.
3. Push the joystick to the left until you reach the desired limit position (The head may be panning left or right depending on the setting of P/T Reverse).

4. Press and release the left hand recessed Range Limit button. The new range limit setting is saved and the left hand Range Limit LED will be on to indicate that the head is at the new pan limit.
5. Press and release the right hand recessed Range Limit button. The right hand Range Limit LED will be flashing to indicate that the limit is wide open.
6. Push the joystick to the right until you reach the desired limit position (The head may be panning left or right depending on the setting of P/T Reverse).
7. Press and release the right hand recessed Range Limit button. The new range limit setting is saved and the right hand Range Limit LED will be on to indicate that the head is at the new pan limit.

Tilt Limits

1. Select the head (CAM 1 through CAM 6) that you want to set the limits on. Before tilting the head, make sure that nobody will be hit by any part of the head or payload. Make sure that you can see the head as it moves, or have an assistant watch the head and tell you when to stop to prevent a collision.
2. Use the tip of a pencil (or a similar non-metallic instrument) to press and release the upper recessed Range Limit button. The upper Range Limit LED will be flashing to indicate that the limit is wide open.
3. Push the joystick up until you reach the desired limit position (The head may be tilting up or down depending on the setting of P/T Reverse).
4. Press and release the upper recessed Range Limit button. The new range limit setting is saved and the upper Range Limit LED will be on to indicate that the head is at the new tilt limit.
5. Press and release the lower recessed Range Limit button. The lower Range Limit LED will be flashing to indicate that the limit is wide open.
6. Push the joystick down until you reach the desired limit position (The head may be tilting up or down depending on the setting of P/T Reverse).
7. Press and release the lower recessed Range Limit button. The new range limit setting is saved and the lower Range Limit LED will be on to indicate that the head is at the new tilt limit.

Joystick Setup

When the joystick is mechanically centered (i.e. not being touched), the head's pan and tilt axes should be stationary. If there is any "creeping" of pan or tilt, you should center the joystick. In addition, depending on how you like the joystick to feel, you can adjust the speed and deadband.

Joystick Centering

1. With the joystick centered mechanically (i.e. not being touched), press and hold the SHIFT button while pressing and releasing the 0/CAL button.

Joystick Speed

1. Press CAM 1.
2. Use the numeric keypad to enter a value of 01, 02, 03 or 04 in the CAM 1 display window. A value of 04 is the slowest, 01 is the fastest and 02 is the factory default.
3. Use the tip of a pencil (or a similar non-metallic instrument) to press and hold the recessed ALT button while pressing 4 on the numeric keypad. The new setting for Joystick Speed is now stored in non-volatile memory.

Joystick Deadband

1. Press CAM 1.
2. Use the numeric keypad to enter a value from 01 to 09 in the CAM 1 display window. A value of 01 is the smallest deadband, 09 is the widest and 03 is the factory default.
3. Use the tip of a pencil (or a similar non-metallic instrument) to press and hold the recessed ALT button while pressing 2 on the numeric keypad. The new setting for Joystick Speed is now stored in non-volatile memory.

The system is now ready for operation - refer to Chapter 2.

4 Maintenance And Repair

Routine Maintenance

The MultiController 2 requires no routine maintenance.

Electronics Repair

Service Philosophy

Servicing is supported at three levels by Vinten Inc. after the 12-month warranty period expires:

- On-site service may be contracted from Vinten Inc. or through the representative from whom the system was purchased.
- Board-level replacement may be readily accomplished by station personnel, using stocked or ordered circuit boards.
- Component level replacement is feasible to some extent, by qualified station engineers or technicians, using the material in this chapter.

Service questions may be directed to factory service specialists at Vinten Inc. in Valley Cottage, NY, by phone at 1-845-268-0100, or toll free (in the U.S.A.) at 1-888 4 VINTEN (1-888-484-6836). You can also fax Vinten at 1-845-268-0113. An emergency telephone service is available 24 hours a day, seven days a week using the 1-845-268-0100 or 1-888 4VINTEN numbers.

Safety

WARNING! Service should only be performed by qualified personnel, who are familiar with the equipment. At some points inside the MultiController 2 chassis and power supplies 120 (or 240) volts AC is exposed, with a potential of electrical shock.

WARNING! If you must work on a head that is powered up, place a large WARNING sign at the MultiController 2 to alert other personnel that they should not attempt to use the system.

WARNING! If you must work on a head that is powered up, follow tagout procedures that meet local and federal requirements.

This page left blank intentionally.

A

Air-Time Philosophy 2–11
Alt Button 2–6

C

Cables, Data 1–11
Camera Select 2–5
CE Compliance, Grounding 3–6
Command Function On/Off 2–12
Command Function Status 2–12
Command Functions 2–12, 3–12
Control Function LEDs 2–6
Copyright vi
Creating 2–8
Creating Shots 2–8
Cueing 2–11
Customer Responsibility 1–2

D

Data Cables 1–11, 3–9
Dimensions, Recessed Mount 3–5
Dimensions, Tabletop 3–4
Disclosure Statement vi
Display Windows 2–5

E

Electrical Installation 3–8
Electronics Repair 4–3
Exploring Moves 2–10

F

Features 1–9
Fixed Speed 3–16
Focus 2–4
Framing Shots 2–7

G

Grounding For CE Compliance 3–6

H

Head Cofiguration 3–16

I

Installation
- Command Functions 3–12
- Data Cables 3–9
- Electrical 3–8
- Grounding 3–6
- Head Configuration 3–16
- Joystick Setup 3–20
- Mechanical 3–4
- Monitors 3–7, 3–10
- Power Supplies 3–6
- Powering Up 3–14
- Range Limits 3–18
- Router 3–6, 3–10
- Tally 3–11

Interconnection 3–8

J

Joystick Centering 3–20
Joystick Deadband 3–20
Joystick Operation 2–3
Joystick Reverse 2–4
Joystick Sense 2–7
Joystick Setup 3–20
Joystick Speed 3–20
Jump Transitions 2–9
Jump, Stopping 2–10

L

Lens Focus 2–4

M

Mains On/Off 2–3
Mains Power 2–3
Manual Operation 2–7
Manual Outline 1–6
Mechanical Installation 3–4
Monitors, Installation 3–7, 3–10
Move Transitions 2–9
Move, Stopping 2–10
Moves, Exploring 2–10
Moves, Multiple 2–10
MultiController II Critical Data iii
MultiController II Installation 3–4
Multiple Moves 2–10

N

Numeric Keypad 2–6

O

On Shot LED 2–5
Operation 2–3, 2–4, 2–5
- Alt Button 2–6
- Joystick Sense 2–7
- Lens Focus 2–4
- Numeric Keypad 2–6
- Pan And Tilt Limits 2–7
- PTZ Joystick 2–3
- Range Limits 2–6

P

P/T REV 2–4
Pan and Tilt Heads 1–12
Pan Limits 2–7, 3–18
Pinch Points 1–4
Power On/Off 2–3
Power Supplies 1–11, 3–6
Power Switch 1–4
Powering Up 3–14
Proportional Speed 3–16
PTZ Joystick 2–3

R

Range Limits 2–6, 3–18
Recalling 2–9
Recalling Shots 2–9
Recessed Mounting 3–5
Reverse Joystick 2–4
Router Installation 3–6, 3–10

S

Safe Operating Zone 1–2
Safe Working Environment 1–2
Safety 1–2, 4–3
- Customer Responsibility 1–2
- Pinch Points 1–4
- Power Switch 1–4
- Sharp Edges 1–4
- Warning Signs 1–3

Select Camera 2–5
Service Philosophy 4–3
Sharp Edges 1–4
Shot Functions 2–5
Shots 2–8, 2–9
- Framing 2–7
- Move/Jump 2–9
- Time 2–9
- Transitions 2–9
- Trimming 2–10

Speed, Proportional/Fixed 3–16
Stopping A Move/Jump 2–10
Switcher Control 1–12
System Configuration 1–10

T

Tabletop Dimensions 3–4
Tally 1–12
Tally Interconnect 3–11
Technical Support iv
Tilt Limits 2–7, 3–18
Time 2–4, 2–9
Tracking 2–11
Transitions 2–9
Transitions, Move/Jump 2–9
Trimming 2–11
Trimming A Shot 2–10

W

Warning Labels ii
Warning Signs 1–3
Warnings 1–2
Warranty v

This page left blank intentionally.